

CLAIMS

What is claimed is:

1. A female coupling member in a pipe coupling having a female coupling member and a male coupling member that is inserted into and connected to said female coupling member, said female coupling member comprising:

a fluid passage that has a first end for connecting to a conduit and a second end for connecting to the male coupling member, and

a valve, provided within said fluid passage, that is moveable between an open position that permits the flow of a fluid between the first-end side and the second-end side of said fluid passage, and a closed position that blocks the flow of fluid,

wherein,

said valve is provided with a purge flow path that allows said second-end side of said fluid passage to communicate with the outside when said valve is in said closed position, and that is closed when said valve is in said open position.

2. A female coupling member according to claim 1, further comprising:

a valve body mounting hole provided so as to cross said fluid passage, and

a gasket having a through hole aligned with and communicating with said fluid passage,

wherein:

said valve body is cylindrical in shape, is mounted coaxially within said valve body mounting hole, is rotatable about its centerline between said open position and closed position, and has an outside peripheral surface that slides in tightly sealing contact with said gasket while rotating between said open position and closed position,

said purge flow path has an inside opening at one end that is open to said outside peripheral surface and an outside opening at the other end that communicates to the outside of said pipe coupling, where said inside opening is closed by tightly sealing engagement to said gasket when said valve body is in said open position, but is released from this tightly sealing engagement when said valve body is in said closed position, and thus communicates with the second-end side of said fluid passage.

3. A female coupling member according to claim 2, wherein:

said valve body mounting hole has a circular cross section and is mounted so as to be perpendicular to said fluid passage,

a pair of openings are formed in the peripheral wall surface of said valve body mounting hole with said fluid passages crossing,

said gasket is such that said through hole thereof aligns to and communicates with one of said pair of openings, and has a tightly sealing engagement surface in the shape of an arc centered about the axis of the valve body mounting hole,

said outside peripheral surface of said valve body has a diameter so as to slide in tightly sealing engagement with said tightly sealing engagement surface of said gasket,

a gap is formed between said outside peripheral surface and the peripheral wall surface of said valve body mounting hole, and the other of said pair of openings is in communication with said gap,

said valve body has a valve hole that passes through said valve body extending in the direction of the diameter perpendicular to the axis of said valve body, and opens on said outside peripheral surface of said valve body,

said valve hole communicates with the through hole of said gasket when said valve body is in said open position, and the communication with said through hole is cut off when said valve body is in said closed position,

said inside opening of the purge flow path is blocked by the tightly sealing engagement surface of said gasket when said valve body is in said open

position, and the engagement with said tightly sealing engagement surface is removed when said valve body is in said closed position, being open to a position communicating with said gap.

4. A female coupling member according to any of claims 1-3, further comprising:

a hole formed such that it passes in a radial direction through the peripheral wall of said female coupling member that demarcates the flow path on the second-end side,

a locking member that is mounted within said hole, that is moveable in the radial direction of said female coupling member, and that can be displaced between:

a locked position that engages the male coupling member inserted within said female coupling member and secures said male coupling member to said female coupling member, and

an unlocked position where the engagement with said male coupling member is released and , thus, the securing of said male coupling member to said female coupling member is released,

a sleeve that is slidably mounted to the outside periphery of the peripheral wall of said male coupling member, said sleeve being slidable between:

a first position where said locking member is pushed inward in the radial direction and said locking member is put into said locked position, and

a second position where the pushing of said locking member is released toward the side of said valve in comparison to said first position, thus permitting said locking member to assume said unlocked position,

a spring that urges said sleeve toward said first position,

a cam attached to said valve, said cam being adapted to engage said sleeve and block said sleeve from being moved to said second position when said male coupling member is inserted into said female coupling member and said

sleeve is in said first position, when said valve body is moved from said closed position to said open position.

5. A female coupling member according to any of claims 1-3, further comprising:

- a first hole formed so as to pass in a radial direction through the peripheral wall of said female coupling member that demarcates the flow path on said second-end side,

- a locking member that is mounted within said first hole, that is moveable in the radial direction of said female coupling member, and that can be displaced between:

- a locked position that engages the male coupling member inserted within said female coupling member and secures said male coupling member to said female member, and

- an unlocked position where the engagement with the male coupling member is released and the securing of the male coupling member to the female coupling member is released,

- a sleeve that is slidably mounted to the outside periphery of the peripheral wall of said male coupling member, said sleeve being slidable between:

- a first position where said locking member is pushed inward in the radial direction and said locking member is put into said locked position, and

- a second position where the pushing of said locking member is released toward the side of said valve in comparison to said first position, thus permitting said locking member to assume said unlocked position,

- a first spring that urges said sleeve toward said second position,

- a second hole formed so as to pass in a radial direction through said peripheral wall of said female coupling member,

- a securing member that is mounted within said second hole so as to be moveable in the radial direction, said securing member being movable between:

a secured position that engages said sleeve when at said second position and blocks said sleeve from moving to said first position, and

an unsecured position where said securing member is moved from said secured position toward the inside in the radial direction, permitting said sleeve to move toward said first position,

a securing member holding member that is mounted within the fluid passage on said second-end side, that can be moved between:

a first position that holds said securing member in said securing position, and

a second position more toward the side of said valve than said first position, that permits said securing member to assume said unsecured position,

said securing member being moved to said second position, when moved by a male coupling member inserted into said female coupling member as the male coupling member is connected to said female coupling member, and

a second spring that urges said securing member holding member toward said first position.

6. A female coupling member according to claim 5, further comprising:

a cam that is attached to said valve and engages said sleeve, and said cam is such that:

when said male coupling member is inserted into said female coupling member and is at a position connected to said female coupling member,

when said valve body is moved from said closed position to said open position, said cam moves said sleeve from said second position to said first position against said first spring, and

when said valve body is moved from said open position to said closed position, said first spring moves said sleeve from said first position to said second position,

but when said male coupling member is not inserted into the female coupling member, the movement of said valve body from said closed position to the open position is prevented by the engagement of said sleeve.